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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/538,078	06/09/2005	Sung-Chul Choi	3449-0500PUS1	7191
2292 7590 01/28/2008 BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747			EXAMINER REAMES, MATTHEW L	
			ART UNIT 2891	PAPER NUMBER
			NOTIFICATION DATE 01/28/2008	DELIVERY MODE ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

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Office Action Summary	Application No. 10/538,078	Applicant(s) CHOI, SUNG-CHUL	
	Examiner Matthew L. Reames	Art Unit 2891	

- The MAILING DATE of this communication appears on the cover sheet with the correspondence address -

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 November 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB08)
Paper No(s)/Mail Date <u>7/27/2007</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 11/1/07 have been fully considered but they are not persuasive. Applicant argue that a 102(b) rejection is improper since multiple references are used.. This is not found convincing since Tanaka t (JP 11-354840) teaches all the elements of the claim. Tanaka Jpn. Appl. Phys. and Tanaka phys. stat sol (b) teach and inherent property of the process. Specifically they teach that using the anti surfactant taught in JP 11-354840 causes a SiN mask and then the quantum dots are grown up through the mask. Therefore JP 11-354840 inherently teaches the process .and thus anticipatory under U.S.C. 102(b).

Applicant further argues Tanaka does not teach filling holes to form t quantum dots. This is not found convincing since Tanaka Jpn. J. Appl. Phys page L833 second column explicitly states that the GaN occurs through the masked thus holes are filed by the growth process.

Therefore all rejection are deemed proper and maintained.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claim 1,5-10,12,13,14,15 is rejected under 35 U.S.C. 102(b) as anticipated by Tanaka (JP 11-354840) in view Tanaka (phys. Stat. sol.) ant Tanaka (JJAP).

a. As to claims 1,5,6 and 10, Tanaka (JP) teaches a device and making the device n-type semiconductor layer formed on a substrate (see item 2); at least one layer of quantum dots (item 3); and a p-type contact (see item 5). Tanaka teaches the use of tetraethyl silicon as an antisurfactant

Tanaka does not explicitly teach an insulating layer is formed.

Tanaka (phys Stat. Sol. and JJAP) teaches that the use of tetraethyl silicon as an antisurfactant cause the growth of SiN which acts as a nanomask (see discussion), which has nanoholes with holes on the order of 1-100 nm.

Therefore Tanaka (JP) inherently teaches the use of an insulating layer.

b. As to claim 7, Tanaka teaches a InGaN material (see e.g. paragraph 21).

c. As to claims 9 and 12 Tanaka (stat sol) teaches that the size and density depends of deposition time (see e.g. discussion).

4. Claims 8,13, are rejected under 35 U.S.C. 102(b) as being anticipated by Hoon (2001/0039066).

5. Hoon teaches a GaN device with a plurality of holes in an instrinsic semiconductor (an insulator) formed by filling holes (see e.g. abstract and fig. 8).

Further Hoon teaches direct contact between the quantum dot layer and the n clad and the p clad.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claim 2-4,11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka (40) as applied to claim 1 above, and further in view of Tanaka (JP 11-354839).

a. As to claims 2-4,11 Tanaka (40) teaches a multi-level GaN quantum dot structure with a GaN barrier layer (item 3C), but is silent to whether it can be used in a multi quantum well LED.

Tanaka (39) teaches a multi-level dot LED structure with a GaN barrier (see item 3B) but is silent to how it is form.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to have form the mulit level quantum dot LED of (39) using the method of (40) which use a nanomask to form the quantum dot layers.

8. Claim 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoon I view of Tanaka.

a. Hoon teaches forming the p-type layer first then growing the quantum dots and then forming the n-type layer.

However it is widely known to grow the n-type clad on the substrate first then the active (quantum dot) and finally the p-type clad (see e.g. Tanaka).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to have reversed the growth steps.

One would have been so motivated since it was common practice enabling easier growth of the layer structure.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew L. Reames whose telephone number is (571)272-2408. The examiner can normally be reached on M-Th 6:30-5:00.

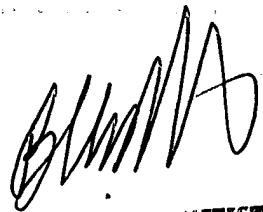
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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, B. William Baumeister can be reached on (571)272-1722. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MLR


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